IN THE UNITED STATES PATENT AND TRADEMARK OFFICES

IN THE APPLICATION OF:

W. PRESTON BARNES ET AL.

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GROUP ART UNIT: 1714

TITLE: LOW ASH STATIONARY GAS ENGINE LUBRICANT

Wickliffe, Ohio
Dated: August 22, 2006

Hon. Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

37 C.F.R. 1.132 DECLARATION

I, Virginia Carrick declare as follows:

I received a Bachelor of Science degree with a major in chemistry in 1986 from John Carroll University. I have been employed by The Lubrizol Corporation since 1987 as a chemist. Since 1992 I have been responsible for formulating lubricants for various engines including stationary gas, heavy duty diesel, compressed natural gas and 4 stroke motorcycle engines. I am one of the inventors in the above-mentioned application, and I am familiar with the references which were used in the rejection thereof.

I certify that this correspondence is being submitted electronically via EFS with the Commissioner for Patents, U.S. Patent & Trademark Office, P.O. Box 1450, Alexandria, Virginia 22313-1450 on:

8-22-06
Date of Deposit

By: Nancy S. Dedek
Nancy S. Dedek

I have read, reviewed and understand the contents of the above-identified patent application. In order to illustrate the improvement and performance of the lubricant composition of the above identified invention, the following experiments were performed according to my directions and instructions and under my supervision.

An experiment was performed by comparing various combinations of the lubricant composition of Sample A as taught in Palazzotto et al. (U.S. Patent Number 6,642,191) ('191) to the lubricant composition of the present invention. The present invention and various combinations of Sample A in '191 were run in the Panel Coker Test as described in the present application (see page 17). The results of the test are shown in Tables 1 and 2.

The detergents selected for the experiment include both high and low TBN detergents. The definition of a low TBN detergent refers to a detergent with a TBN value less than 100, while a high TBN detergent refers to a detergent with a TBN value greater than 100.

Palazzotto et al. (Sample A)

Sample A was prepared by combining 0.91 wt. % 3,5-di-t-butyl 4-hydroxy phenol propionate, 3.3 wt.% dispersant, 3.4 wt.% detergent, 0.38 wt.% wear inhibitor, 5 ppm foam inhibitor and Group II base oil. Note: Since Sample A did not specify specific detergent and/or dispersants, various versions of Sample A were run using different combinations of detergents, dispersants and wear inhibitors. The detergents selected for the experiments included a high and low TBN calcium sulfonates and a high TBN calcium phenate. The dispersants selected were a high and low molecular weight succinimide dispersants. Zinc dithiophosphate was selected as the wear inhibitor. These are all commonly used additives in lubricant chemistry and represent a meaningfully diverse selection of components.

Examples 1(a) and 1(b)

Examples 1(a) and 1(b) were prepared by combining 1.0 wt. % 3,5-di-t-butyl 4-hydroxy phenol propionate, 4.24 wt.% low molecular weight succinimide dispersant, 0.50 wt.% ashless antiwear inhibitor, 70 ppm foam inhibitor, Group II base oil and a detergent. Note: The detergent used for Example 1(a) was a low TBN calcium sulfonate present in an amount of 2.0 wt. %; the detergent used for Example 1(b) was a high TBN calcium sulfonate present in an amount of 0.42 wt. %.

The formulations prepared for testing are shown in Tables 1 and 2.

Table 1: Palazzotto et al. Comparative Sample A

6,642,191	Sample A1	Sample A2	Sample A3	Sample A4	Sample A5	Sample A6
Group II base oil	100	100	100	100	100	100
Succinimide dispersant A	3.3	3.3	3.3			
Succinimide dispersant B				3.3	3.3	3.3
Low TBN Ca sulfonate detergent (TBN = 10)	3.4			3.4		
High TBN Ca sulfonate detergent (TBN = 300)		3.4			3.4	
High TBN Ca phenate detergent (TBN = 255)			3.4			3.4
zinc dithiophosphate	0.38	0.38	0.38	0.38	0.38	0.38
3,5-di-t-butyl 4-hydroxy phenol propionate antioxidant	0.91	0.91	0.91	0.91	0.91	0.91
foam inhibitor	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Percent Ash*	0.4	1.4	1.1	0.4	1.4	1.1
Panel Coker Deposit Test, Universal Rating (higher is better)	**90**	**78**	**45**	**94**	**70**	**43**

Note: Except for the Panel Coker results all values are presented in weight percent. Additionally, all the above components/ingredients contain conventional amounts of diluent oil.
Note: Succinimide dispersant A is a low molecular weight succinimide dispersant containing a condensed amine.
Note: Succinimide dispersant B is a high molecular weight succinimide dispersant.
*Note: Percent Ash is measured on the finished lubricating oil of Sample A1-A6.

Table 2:

	Example 1(a)	Example 1(b)
Group II base oil	100	100
Succinimide dispersant A	4.24	4.24
Low TBN Ca sulfonate detergent (TBN = 10)	2	
High TBN Ca sulfonate detergent (TBN = 300)		0.42
ashless antiwear	0.50	0.50
3,5-di-t-butyl 4-hydroxy phenol propionate antioxidant	1	1
Foam inhibitor	0.007	0.007
Percent Ash	0.17	0.17
Panel Coker Deposit Test, Universal Rating (higher is better)	**92**	**61**

Note: Except for the Panel Coker results all values are presented in weight percent. Additionally, all the above components/ingredients contain conventional amounts of diluent oil. Note: Succinimide dispersant A is a low molecular weight succinimide dispersant containing a condensed amine.
Note: ashless antiwear agent is TPP (tri-phenyl phosphite)
Note: Example 1(a) is an example of the present invention.
*Note: Percent Ash is measured on the finished lubricating oil of Examples 1(a) and 1(b).

The above data in Table 1 demonstrates that, in contrast to the conclusions in '191 (see Col 12, lines 27-34), significant differences in lubricant performance were found when the detergent component was varied in a lubricant composition. Therefore, the data shows that one skilled in the art can not arbitrarily choose a detergent combination and expect certain results in a given test.

Additionally, the data in Tables 1 and 2 demonstrates that the low TBN detergent, low-ash lubricant composition of the present invention (Example 1(a)) produces unexpectedly equivalent good performance compared to the high TBN detergent, higher ash formulations of Sample A (Samples A1 and A4). This comparison is significant because less ash present in a lubricant composition equates to better engine emission performance.

Comparing formulations with identical percent ash values, Example 1(b), which uses a high TBN detergent, fails to show equivalent performance in the Panel Coker Test compared to Example 1(a), which uses a low TBN detergent. This comparison is significant because it demonstrates that in lubricant formulations with low ash values (less than 0.2), detergent selection is critical for performance.

I further declare that all statements herein made of my own knowledge are true and all statements herein made on information and belief are believed to be true. I understand that willful false statements and the like are punishable by fine or imprisonment or both (18 U.S.C. 1001) and may jeopardize the validity of this application or any patent issuing thereon.

Virginia Carrick

Virginia Carrick

08/21/06

Date

Witness